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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER
TRA, TUYEN Q

ART UNIT	PAPER NUMBER
2873	

DATE MAILED: 05/09/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/715,867	Wang et al.	
	Examiner	Art Unit	
	Tuyen Q Tra	2873	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 February 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2-4,6-15 and 18* is/are rejected.

7)☒ Claim(s) *5,16,17 and 19* is/are objected to.

8)☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15)☐ Notice of References Cited (PTO-892)
16)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
17)☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *9* .
18)☐ Interview Summary (PTO-413) Paper No(s). _____ .
19)☐ Notice of Informal Patent Application (PTO-152)
20)☐ Other:

DETAILED ACTION

Reconsideration of Cited Art

1. After reconsideration of the cited art (Robinson et al.), the Examiner found a structure with electrodes coated with reflective material (col. 8, lines 60-67; col. 9, lines 1-5, 13-14, Fig. 3) which function as mirrors (as claimed by applicant). Therefore, the indicated of allowability of claims 5, 13-15 are withdrawn and new rejection is set forth below.

Claim Objections

2. Claim 12, " the modulator of claim 6" should be "the modulator of claim12".

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims **15, 4, 8, 10** and **11** are rejected under 35 U.S.C. 103(a) as being unpatentable over Robinson et al. (U.S. Pat. 6,091,463 A).

a) With respect to claim **15**, Robinson et al. discloses a diffractive spatial light modulator in Fig. 3 comprising of:

an array of pixels formed on a semiconductor substrate, each pixel including a solid state electro-optic material positioned between a electrode and a second electrode;

a first reflective electrode underneath the electro-optic material and a second reflective electrode above the electro-optic material forming a cavity (col. 8, lines 60-67; col. 9, lines 1-5, 13-14);

an array of pixel circuits formed with the semiconductor substrate, each pixel being connected to a pixel circuit.

However, Robinson et al. does not implicitly discloses a first mirror and second mirror. Since both mirrors and reflective electrodes function as a light reflecting device, the selection of mirrors in place of reflective electrodes is seem as design experience upon the environment of use to ensure optimum performance. Therefore, it would have been obvious at the time the invention was made to a person having skill in the art to replace the reflective electrodes in optical modulator with mirrors for matter of design choice.

b) With respect to claim **4**, Robinson et al. discloses a diffractive spatial light modulator comprises pixel circuits comprising of an array of transistors formed on a silicon substrate (col. 4, lines 20-29, Fig. 2).

c) With respect to claims **8, 10** and **11**, Robinson et al. disclose a spatial light modulator with semiconductor comprises a CMOS integrated circuit (col. 2, lines 38-41), a memory circuit collocated with each pixel, and each pixel circuit comprises a RAM (col. 4, lines 33-40).

5. Claims **6, 12-14** and **18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Robinson et al. (U.S. Pat. 6,091,463 A), as applied to claim 15, in view of Birnbach et al. (U.S. Pat. 4,786,128).

a) With respect to claims **6** and **12-14**, Robinson et al. discloses a spatial light modulator and method comprising of an electro-optic material. However, Robinson et al. does not implicitly disclose that the electro-optic material comprising of plurality of layers. Within the same field of endeavor, Birnbach discloses a spatial light modulator with electro-optic material is a plurality of electro-optic material layers (col. 7, line 17-18, Fig.13).

It would have been obvious, therefore, at the time the invention was made to a person having skill in the art to construct a spatial light modulator with electro-optic material such as disclosed by Robinson et al., with electro-optic material comprising of a plurality of layers such as discloses by Birnbach, for purpose of simplifying manufacturing process.

b) With respect to claim **18**, Robinson et al. discloses a spatial light modulator and method comprising of electro-optic material layer, first and second electrodes. However, Robinson et al. fails to teach first and second electrodes comprises of an optically transmissive conductive material. Within the same field of endeavor, Birnbach discloses a spatial light modulator with electrodes 14 and 16 comprise of layer L1 and L2 are optically transmissive conductive material (col. 5, line 1-3).

It would have been obvious, therefore, at the time the invention was made to a person having skill in the art to construct a spatial light modulator with a first and second electrodes such as disclosed by Robinson et al., with first and second electrodes material comprising of an

optically transmissive conductive material such as discloses by Birnbach, for purpose of transmitting light to mirror.

6. Claim **7** is rejected under 35 U.S.C. 103(a) as being unpatentable over Robinson et al. (U.S. Pat. 5,768,003), as applied to claim 15, in view of Bowman et al. (U.S. Pat. 5,637,883).

Robinson et al. discloses a spatial light modulator and method comprising of electrode layers. However, Robinson et al. does not implicitly disclose that the electrode layers comprises of an electrically conductive layer that contacts a dielectric layer. Within the same field of invention, Bowman et al. discloses a spatial light modulator comprises an electrode layer comprising of an electrically conductive layer 28 that contacts a dielectric layer 26 (see Fig.1).

It would have been obvious, therefore, at the time the invention was made to a person having skill in the art to construct a spatial light modulator with electrode layers such as disclosed by Robinson et al., with an electrode layer comprising of an electrically conductive layer 28 that contacts a dielectric layer 26 such as discloses by Bowman et al., for purpose of forming a mirror layer in spatial light modulator.

7. Claims **2, 5** and **9** are rejected under 35 U.S.C. 103(a) as being unpatentable over Robinson et al. (U.S. Pat. 5,768,003), as applied to claim 15, in view of Gobeli (U.S. Pat. 5,768,003).

Robinson et al. discloses an optical device but fails to implicitly disclose solid-state electro-optic material comprising of ceramic material; electro-optic layer having thickness less than 2000nm; a light source and an optical coupler. Within the same field of endeavor, Gobeli

further discloses solid-state electro-optic material 10A comprising of ceramic material (i.e. PLZT) (col. 3, line 65); electro-optic material layer having thickness of 15 nm (col. 3, lines 31-32); a light source and an optical coupler (col. 6, line 46-47).

It would have been obvious, therefore, at the time the invention was made to a person having skill in the art to construct a spatial light modulator with electrode layers such as disclosed by Robinson et al., with solid-state electro-optic material 10A comprising of ceramic material; electro-optic material layer having thickness of 15 nm; a light source and an optical coupler such as discloses by Gobeli for purpose of providing and focusing light to the modulator.

Allowable Subject Matter

8. Claims 16, 17 and 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The reason for the indication of allowable subject matter is that a first mirror underneath the electro-optic material and a second mirror above the electro-optic material; a copper interconnect extending from each pixel mesa along a mesa sidewall to a circuit contact of a pixel circuit disclosed in the claims is not found in the prior art.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuyen Tra whose telephone number is (703) 306-5712. The examiner can normally be reached on Monday to Friday from 8:30am to 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps, can be reached on (703) 308-4883. The fax number for this Group is (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.

Examiner: Tuyen Tra

Date: April 24, 2002

Huy Mai
Primary Examiner